REMARKS

This is in response to the Office Action mailed on May 20, 2003, in which claims 1-17 were rejected under 35 U.S.C. § 102(e) as being anticipated by Korenev et al. (USP 6,429,444) and claims 16 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Korenev et al.

The undersigned would like to thank the Examiner for conducting a telephone interview on July 1, 2003. In this telephone interview, the amendments to the claims and arguments presented in this paper were discussed, but no formal agreement was reached.

With this Amendment, claims 1-4, 6, 7, 13 and 14 have been canceled without prejudice, thereby rendering moot their rejection.

Independent claim 5 has been amended to incorporate the recitations of claim 6. As amended, claim 5 recites a radiation source for providing an electron beam, wherein the electron beam has an x-ray component, and a sensor system for measuring an intensity of a portion of the x-ray component of the electron beam that passes through product being irradiated. The inventors of the present invention discovered that x-rays are emitted as a byproduct of generation of an electron beam. See, e.g., page 8, lines 9-11. The inventors utilized this fact to configure an irradiation system in which an electron beam is generated to irradiate product, while an x-ray sensor is provided on the opposite side of the product to measure the intensity of the x-rays that pass through the product. The measured intensity of those x-rays is then used, along with the measured beam current of the radiation source, to determine the dose of radiation ~~received~~ by the product. Independent claims 11 and 12 (as amended) and claim 16 also recite this feature of the present invention.

The measurement of x-rays on the opposite side of the product, rather than of the electron beam itself, is advantageous. The electron beam delivered to the product can often be nearly completely absorbed by the product, leaving little or no electron beam intensity to measure on the opposite side of the product. X-rays, on the other hand, are able to penetrate product much more deeply, and therefore are nearly certain to have a portion pass through the product so that the

CONCLUSION

In view of the foregoing, all pending claims 5, 8-12 and 15-17 are in condition for allowance. Since this Amendment cancels claims and places the remaining claims in condition for allowance (or at least in better form for appeal), entry after final is appropriate under 37 C.F.R. 1.116(b). Reconsideration and allowance of all pending claims 5, 8-12 and 15-17 is accordingly respectfully requested.

The Examiner is cordially invited to contact the undersigned at the telephone number listed below if such a call would in any way facilitate the allowance of this application.

Respectfully submitted,

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Date: 7/2/03

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suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. See M.P.E.P. 2143.

The teaching of Korenev et al. is that the disclosed invention will find application in conjunction with monitoring electron beams used to form other particles or other types of radiation, such as the conversion of the electron beam to x-rays or gamma rays. The present invention, as claimed, does not convert an electron beam to x-rays. This conversion is one known way to generate x-rays that would be used to irradiate product, but the invention as claimed irradiates product with an electron beam rather than x-rays. Instead, the present invention senses the x-rays that are emitted as a byproduct of generating the electron beam, and uses those results to determine a dose of radiation delivered to a product by the electron beam. In a system such as is claimed, where an electron beam irradiates product and there is no conversion of an electron beam to x-rays, there is no teaching of Korenev et al. that would suggest employing an x-ray exit sensor. Obviousness can only be established by modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion or motivation to do so found either explicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. M.P.E.P. 2143.01. Since no such teaching, suggestion or motivation has been found to employ an x-ray exit sensor in an electron beam irradiation system, it would be improper to reject the claims under 35 U.S.C. § 103 as being obvious.

Moreover, if a modification were made to Korenev et al. to employ an x-ray exit sensor, according to the teachings of Korenev et al. the resulting system would convert the electron beam to x-rays. This system would provide x-rays that impinge upon the product being irradiated rather than an electron beam, as required by the claims. Thus, the modified teachings of Korenev et al. would still not teach or suggest all of the claim limitations. To establish obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. M.P.E.P. 2143.03, citing In re Royka, 180 U.S.P.Q. 580 (C.C.P.A. 1974). Since the modified teachings of Korenev et al. do not teach or suggest all of the limitations of the claims, a rejection of the claims under 35 U.S.C. § 103 as being obvious would be improper.

intensity of the x-rays can be measured and correlated to an equivalent dose of radiation delivered to the product. See specification at page 14, lines 11-17.

The Korenev et al. patent (USP 6,429,444) cited to reject the pending claims does not disclose, teach or suggest an irradiation system in which an electron beam is delivered to irradiate product while x-rays are sensed on the opposite side of the product to determine an equivalent dose of radiation delivered to the product. By contrast, the Korenev et al. system teaches that an electron beam (22) is emitted to irradiate product (30), and that radiation detector arrays (40a, 40b, 40c) are positioned adjacent the electron beam to measure the strength of the electron beam before entering the product and upon exiting the product. There is no teaching of measuring x-rays that are emitted as a byproduct of generating the electron beam, nor is there any discussion in the Korenev et al. patent of a motivation to alter the electron beam sensors to employ x-ray sensors in their place. Since Korenev et al. do not disclose, teach or suggest all of the elements recited in independent claims 5, 11, 12 and 16, the rejection of those claims under 35 U.S.C. § 102 should be withdrawn. Claims 7-10, 15 and 17 depend from these independent claims, and are allowable therewith.

In the telephone conference of July 1, 2003, the Examiner suggested that replacing the inductive electron beam sensor of Korenev et al. with an x-ray sensor as recited by the amended claims might be obvious, in view of Korenev et al. stating at column 5, lines 58-64 that "[t]he invention will also find application in conjunction with monitoring electron and other charged particle beams used to form other particles or other types of radiation, such as the generation of ultraviolet irradiation, conversion of the electron beam to x-rays or gamma rays, the production of neutrons, eximer lasers, the production of ozone, and the like."

In order to reject a claim as being obvious, three basic requirements are necessary. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations. Furthermore, the teaching or